

ABSTRACT

An optical delay line for use with an optical source including input/output optics optically coupled to the optical source and a curved mirror with a reflective surface that is centered about an evolute curve of the delay line to retro-reflect light traveling along a delay line beam path tangent to the edge of the evolute curve. The input/output optics direct light from the optical source along the delay line beam path and direct delayed light from the delay line beam path out of the optical delay line along an output beam path. The input/output optics and/or the curved mirror rotate about the evolute curve at a selected angular speed. The reflective surface has a curvature based on a parametric curve that is calculated from the evolute curve such that the delay of the delay line varies according to a predetermined function as the input/output optics and/or the curved mirror rotate.